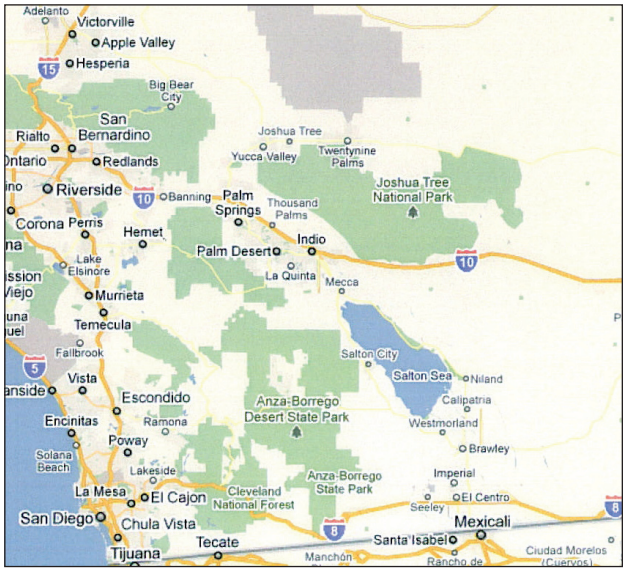
St. Anthony Mobile Home Park
67-075 Highway 111 ❖ Mecca, CA 92254
Drinking Water Assessment Final Report ❖ January 21, 2010

Introduction

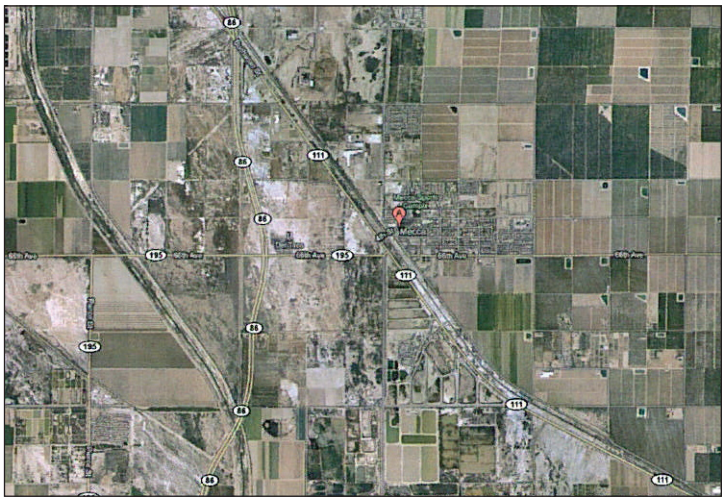
On January 21, 2010 the Rural Community Assistance Corporation (RCAC) technical assistance providers Lucy Castillo-Riley, Juan Carlos Guerreiro, and Eagle Jones conducted a drinking water and wastewater system assessment at the St. Anthony Mobile Home Park in Mecca, CA, which is located in the Coachella Valley. RCAC was accompanied by Poder Popular representative Jose Huerta.

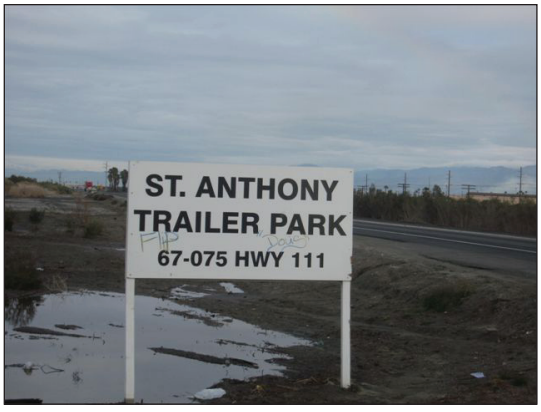
At the time of the survey, there was no park staff to meet with the RCAC technical assistance providers. However, as the initial inspection of the water system began, RCAC was met by Sergio Carranza, who served as a representative for the operation and management of the mobile home park. Sergio was unavailable for the inspection of the water system but agreed to a follow-up meeting with RCAC to complete the assessment.

The mobile home park community consists of 96 service connections serving approximately 700 residents. It operates under a permit issued by Riverside County Public Health Department.



Coachella Valley and St. Anthony Mobile Home Park Area Maps





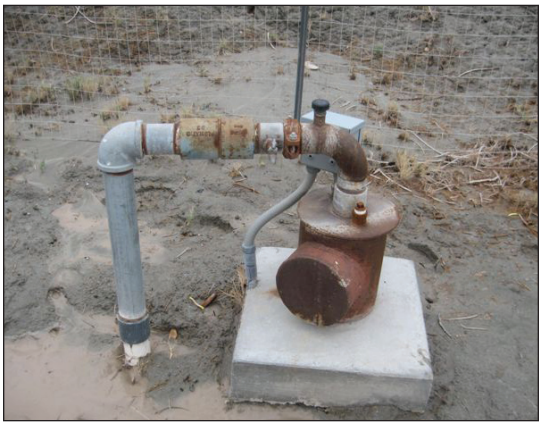
The water system consists of one drinking water well, one hydro-pneumatic tank, and a grid/branch style distribution system. In addition, there are four centralized drinking water tanks that are filled by hauling water using various trucking services located in the Coachella Valley. This provides the residents with a safe supply of drinking water, rather than the tap water that exceeds the maximum contaminant level (MCL) for arsenic.

Drinking Water Source

The drinking water supply at St. Anthony Mobile Home Park is groundwater and it uses a submersible pump for extraction. Since the community's population is less than 10,000 people, the water system is considered a small system, or very small system. This drinking water system qualifies as a Public Drinking Water System (PWS) as defined in the Safe Drinking Water Act (SDWA) and thus must conform to all applicable drinking water standards.

St. Anthony has a single-source drinking water system with no backup supply for the entire community. The drinking water well installation and construction details are unknown; however, the well drillers log is on file with Coachella Valley Water District. This well drillers log would contain vital information, such as whether or not the annular seal meets legal requirements. Many wells in agricultural communities have developed "ag wells" without these seals since they are not required in that application. Often these wells eventually find themselves being used in a public water system.

A visual inspection of the well surface features indicates a basic construction consisting of a 12-inch casing that is reported to extend approximately 600 feet into the aquifer. Well production is unknown, since there is no master water meter at the wellhead. A master meter accounts for all of the water leaving a well. It was reported that the five-horsepower well pump and motor were replaced in 2009.



The well site is poorly fenced and is vulnerable to vandalism.

The well site is poorly fenced but receives some protection from contamination due to its isolation and distance from passing vehicles and any solid waste. A poorly fenced well site is vulnerable to vandalism. The well site itself, along with many of the homes, are located in low parts of the valley which makes the well vulnerable to flash flooding.

The well casing extends approximately 12 inches above the cement pad and is properly sealed at the pad/casing interface. The well driller's log should be consulted to assure the proper annular sanitary seal extends down the length of the casing and meets county or state regulations. It should be noted that wells that were designed for agricultural use do not have these seals and are subject to contamination. Ag wells should not be used as a potable water source. Should the annular seal be determined to be inadequate, an engineer should be contacted to assist with correcting the situation.

The well cap lacked a vent needed for the well to properly "breathe" as the well draws down and recovers. Without this vent the well will pull and push moist air through the electrical connection and may cause premature failure of electrical components by creating a corrosive environ-

ment. In addition, contamination could be introduced through this same connection. The well was equipped with a sampling tap which allow for water samples to be taken directly from the well. The well also had a check valve which prevents any water in the discharge line from flowing back into the well. The well did not have a pressure-relief valve which protects the pump from over-heating if it is ever left pumping against a closed valve. Note that submersible pumps are water-cooled and if water was not circulating around the pump motor, heat would build up, either causing pump fail or damage to the pump.

- **Drinking Water Source:** ***Deficiencies noted, potential solutions*** (see page 7 of this report)

Water Quality

This water system has a history of arsenic concentrations that exceed the MCL established under the Safe Drinking Water Act. The arsenic contamination source in the water supply is likely caused by local geology. Arsenic concentrations above the MCL are a widespread problem within the Coachella Valley region. Due to the elevated levels of arsenic in the drinking water supply, the system is required to monitor arsenic levels on a six month monitoring cycle.

The data from the last arsenic sample collected in the summer of 2004 indicated an arsenic level of 20 parts per billion. The federal maximum contaminant level for arsenic is 10 parts per billion. It is unknown if the residents were notified of arsenic levels, but the residents are aware of the arsenic contamination. The park management currently purchases and hauls water to a centralized point in the community where residents can collect drinking water for drinking and cooking purposes.

There are no procedures for disinfection or sampling for bacteriological contamination of the drinking water tanks.

There currently is no defined maintenance program for maintaining sanitary conditions of the centralized drinking water tanks. The tanks are cleaned periodically and filled approximately every couple of days. There are no procedures for disinfection or sampling for bacteriological contamination of the tanks.

- **Water Quality:** ***Deficiencies noted, potential solutions*** (see page 6-7 of this report)

Drinking Water Treatment

At the follow up meeting with Sergio Carranza, it was not known if the water system provided disinfection either in batch (added in intervals) or continuous. A chlorine residual between 0.2 parts per million and 4 parts per million is necessary to provide a drinking water distribution system with adequate protection against microbiological activity. Sodium hypochlorite and calcium hypochlorite are commonly used chemicals for disinfection within public water systems. The mobile home park does have a certified operator who collects monthly bacteriological samples, but the operator was unavailable to assist with the assessment. The water system is required to collect one bacteriological sample per month. These routine samples are collected at the well head and do not follow any specific site sampling plan and do not assess water quality within the distribution system.

The St. Anthony water system has tried to address the arsenic issues in the past by purchasing an arsenic filtration system. Unfortunately the type of system selected for the removal of arsenic was inadequate, leading to the eventual failure of the filtration system.

- **Drinking Water Treatment:** ***Deficiencies noted, potential solutions*** (see page 6-7 of this report)

Hydro-Pneumatic Tank

The St. Anthony water system uses one steel hydro-pneumatic pressure tank. The installation date is unknown. The hydro-pneumatic tank is designed to provide adequate pressure to the distribution system without causing the pump to cycle continuously. The total volume of the pressure tank is approximately 3,000 gallons and is old, but in fair condition. The pressure is maintained between 40 to 60 psi. The system requires the operator to bring in an air compressor to recharge tank pressure. The tank does not have a level indicator to indicate the amount water/air ratio. The tank is equipped with a pressure relief valve. This valve protects the water distribution system from damage due to high pressure situations. The tank is also equipped with a drain valve which allows the tank to be drained for maintenance or repairs. The last date of tank maintenance or cleaning is unknown.

- **Hydro-Pneumatic Tank:** ***Deficiency noted, potential solution*** (see page 8 of this report); ***recommendation*** (see page 8 of this report)

Distribution System

Piping

The distribution system consists of PVC piping of unknown size and was thought to have approximately 6,000 feet of distribution pipe. There were no known maps of the distribution system available. It was estimated that age of the system is near 30 years old.

The distribution system layout, based on the description, was a gridded/branched system. A flushing program was not administered at the time of the assessment. Public water systems administer flushing programs to routinely clean pipes of debris that accumulate over time. Lines were said to not be adequately sized and were not equipped with valves in appropriate locations. The system maintains adequate pressure, does not have a problem with water leaks, but does have periods of water outages from major leaks or power outages.

- **Piping:** ***Deficiencies noted, potential solutions*** (see page 8 of this report)

Cross Connections

The water system is equipped with a check valve at the well head and after the hydro pneumatic tank. During the inspection possible cross connections were identified and the importance of eliminating cross connections where discussed with the manager.

- **Cross Connections:** ***Deficiency noted, potential solution*** (see page 8 of this report)

Meters

The water system is not equipped with any water meters and does not charge its customers for water.

- **Meters:** ***Deficiency noted, potential solution*** (see page 9 of this report); ***recommendation*** (see page 9 of this report)

Hydrants

The water system is said to have four hydrants but upon assessment of the system only one hydrant was visible. The hydrant is a small, 4 inch by 2 ½ inch wharf style hydrant, typically used for flushing purposes only. Due to the inadequate size of the distribution system piping, it is likely that the hydrants flow would be inadequate to fight fires.

Wastewater System

St. Anthony Mobile Home Park utilizes a centralized septic tank, sewer lift station, in conjunction with a lagoon wastewater disposal system. The system was installed in the 1970's and has been maintained on a reactive basis only. The wastewater treatment system is scheduled to be disconnected due to the construction of a new sewer collection system from the City of Mecca that will serve the community beginning in 2010.

Water System Deficiencies, Suggested Solutions and Recommendations

This section of the report is a comprehensive overview of the water system deficiencies recognized by RCAC staff. Each deficiency is accompanied by suggestions to address the problem. Each suggestion is accompanied by items to consider when choosing a potential solution.

Water Quality and Water Treatment

Arsenic Levels

Deficiency

- Arsenic levels above the Safe Drinking Water Act's maximum contamination limit, which are a threat to public health.

Potential Solutions

- Regionalization may allow the St. Anthony Mobile Home Park to purchase water from a nearby source with lower arsenic contamination levels.
  - ➢ May be delivered by trucks or by pipe.
  - ➢ Depends on the availability of alternative water resources with acceptable arsenic levels.
  - ➢ May be the least expensive solution depending on transportation costs.
- Treatment is a technological means of removing the arsenic from the water source through various methods. This option involves significant technical, managerial and financial investments by the community to construct, operate, and maintain.
  - ➢ Certified staff to operate the facility
  - ➢ Staff to manage the facility
  - ➢ Equipment and supplies

  (This option gives the community more control over their water supply's availability and quality.)

Recommendations:

- ➢ Training park managers will be essential for successfully selecting a dependable arsenic removal system.
- ➢ Connecting to an adjacent water system that has better water quality may also be an option.
- ➢ Drilling a new well could be explored if an area or depth within the aquifer can be determined to be a better source.

Deficiency

- Lack of water quality data leaves the community, water system managers and regulators uninformed as to whether or not the water is suitable for human consumption.

Potential Solutions

- Implement a water quality monitoring program where a certified laboratory determines the contamination levels within the water.
- Once the contamination levels within the water are determined and the results are delivered to the utility, the utility should keep these records in a designated location for future reference.
  - ➢ This program may be costly; however, the public's health would be better protected by accurately determining what they are consuming.

Deficiency

- The drinking water supply is not chlorinated sufficiently, leaving the system vulnerable to bacteriological contamination.

Potential Solutions

- Implement a chlorination system where chlorine levels are held at an adequate level throughout the drinking water system. Refer to the water system's regulatory agency for appropriate chlorine levels.
- Use NSF approved chlorine.

**Note: NSF approval means that the chlorine is suitable for consumption, as is the case when used with drinking water.*

Water Source

Well

Deficiency

- A well driller's log is not in the possession of the water system operators. This leaves system operators unaware of whether the well has an annular sanitary seal that meets regulatory requirements. This could make the well susceptible to contamination through surface water infiltration.

Potential Solution

- Obtain a copy of the well driller's log from the Coachella Valley Water District. Look to see if an annular sanitary seal exists and meets regulatory requirements.

Deficiency

- The well and its equipment are not fenced in properly, leaving it vulnerable to vandalism or damage. The well equipment could be damaged or adjusted without warning, threatening the community's water supply.

Potential Solution

- Have the barrier replaced or repaired around the well and its equipment to protect it from vandalism and damage. This would better protect the community's water supply from being tampered with.

Deficiency

- The well cap lacked a vent needed for the well to properly "breathe" as the well draws down and recovers. Without this vent the well will pull and push moist air through the electrical connection and may cause premature failure of electrical components by creating a corrosive environment.

Potential Solution

- Have a vent installed onto the well. This vent should be able to be angled downward (using and elbow type pipe) to prevent rainwater from entering the well. This vent should be two ventilation pipe diameters away from the ground to prevent surface water from entering the well. Additionally, the vent should be covered with a screen to prevent any large objects from entering the well.

Deficiency

- The well is not equipped with a blow-off valve. This makes the well pump vulnerable to overheating as the water would remain stagnant and heat up if the pump was working against a closed discharge valve.

Potential Solution

- Have a blow-off valve installed at the well.

Hydro-Pneumatic Tank System

Deficiency

- The water-to-air ratio in the hydro-pneumatic tank was unknown. This could lead to a low air level, which could lead to system damage without air available to protect the system against water hammer.

Potential Solution

- Install a sight tube on the tank, or use any other available methods to determine the water to air ratio within the tank. If the air level is low, use an air compressor to add air.

NOTE: The pressure is maintained between 20 and 60 pounds per square inch (psi), and requires the operator to bring in an air compressor to recharge vessel pressure.

Recommendation: There are other means of keeping the water-to-air ratio correct. Two simple methods include:

1. Pouring warm water on the tank and feeling the side of the tank to determine the air/water interface. If there is too much water, then add more air.
2. Pay attention to over-cycling of the pump. If the air cushion is low or the tank is water logged the pump will cycle on and off frequently to compensate for pressure drops in the system. If this occurs more air in required. Pressure relief valves were also missing. These valves protect the system against high pressure condition that may lead to system damage.

Distribution System

Piping

Deficiency

- Pipe size is unknown. In the case of pipes becoming damaged and in need of replacing, it is good to know the size of the pipe that needs to be replaced so the system can return to service in a timely manner.

Potential Solution

- Dig up a section of the distribution system to find out what size of pipe is installed. When the size is noted, the water system managers may find it beneficial to keep spare pipe on site in case a section of the pipe needs to be replaced.

Deficiency

- Water system is not flushed periodically, which may lead to access solids being left in the water system. This can reduce pumping efficiency and could potentially lead to poor water quality.

Potential Solution

- Implement a distribution system flushing program.

Cross Connections

Deficiency

- A cross connection program was not in place. This could lead to cross connections existing in the drinking water system, which could lead to drinking water contamination if a backflow condition occurs.

Potential Solution

- Implement a cross connection program.

Water Meters

Deficiency

- The drinking water system does not have water meters. This limits the ability for water system managers and operators to collect essential data used for water quality and water quantity protection purposes. This also limits the ability to charge rates comparable to water usage.

Potential Solution

- Place a master meter at the well, a meter at each residence, and read monthly.
  - ➢ This would be costly and labor intensive, but would greatly increase the capacity of the water system.
- The use of meters would also enable water system managers to match monthly water consumption with monthly water bills if needed to implement water conservation policy.

Recommendation: Having a master meter at the well head would indicate well production and provide data on the wells ability to continue to meet the communities demand or help determine if there is capacity to expand. Residential meters should be read monthly or bi-monthly.

A consumption-based rate structure based on operating expenses and any needed reserves should be utilized so the water systems can recoup water production costs. A consumption-based rate structure also makes paying for water more equitable between community members. Those that use the most, pay more. This has a tendency to make residents conserve and fix household leaks. Household leaks are major contributor to septic system failure due to hydraulic overloading. Also, comparing total water sold against total water produced tells the water manager how much water is being lost. In some cases this can be substantial due to leaks that don't surface or illegal taps.